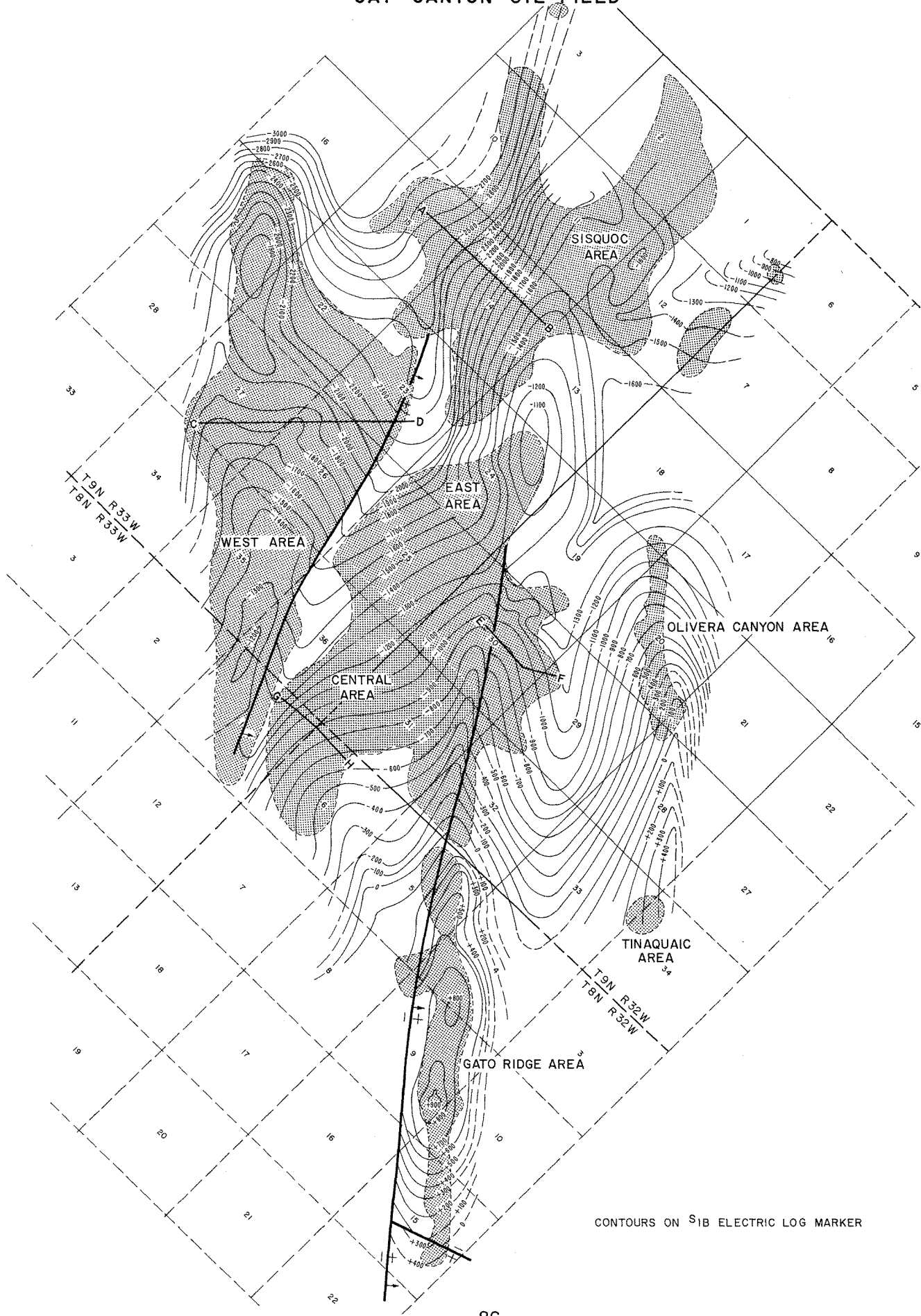


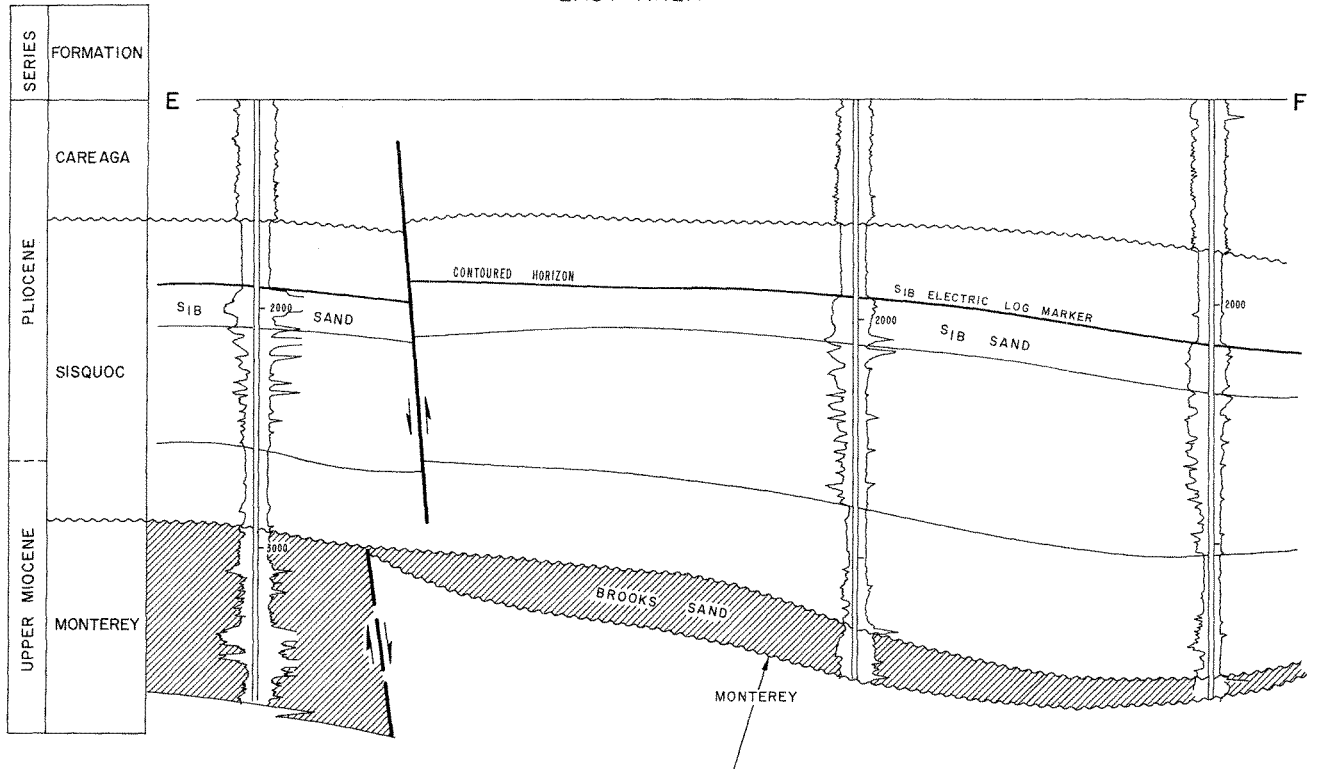
CAT CANYON OIL FIELD



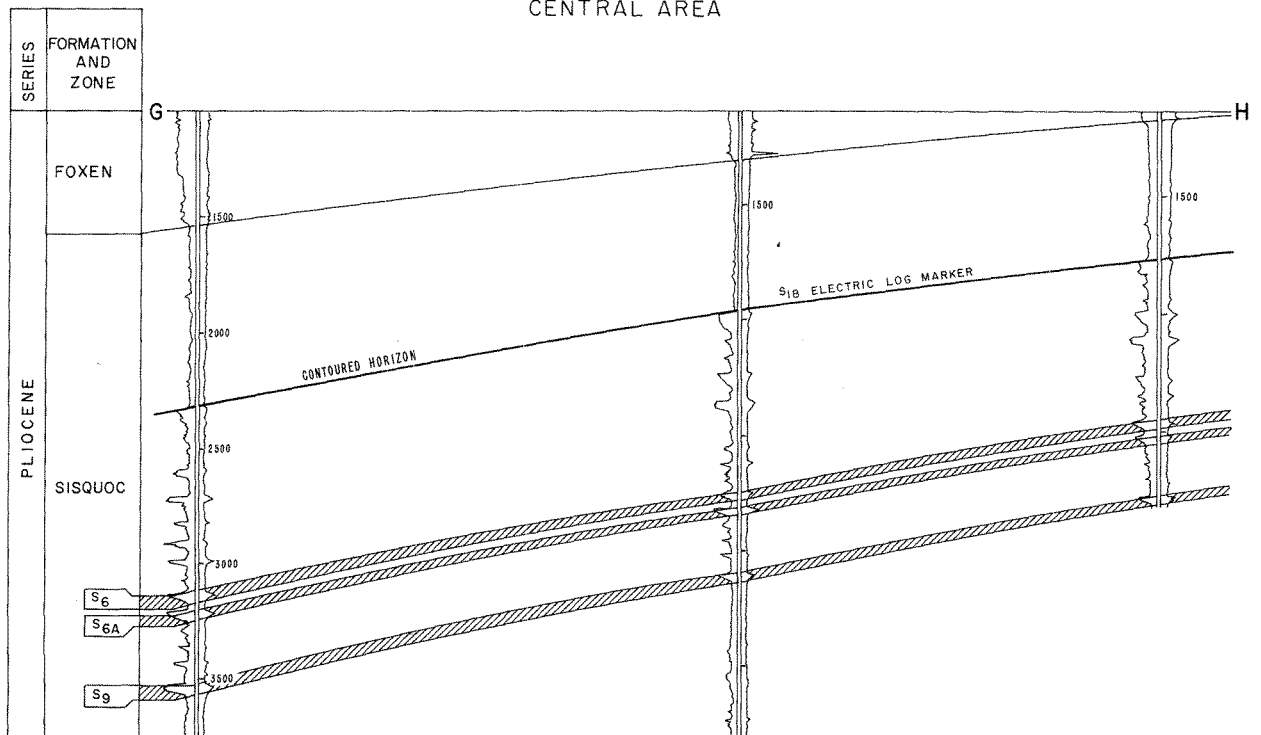
CAT CANYON OIL FIELD

East Area and Central Area

EAST AREA



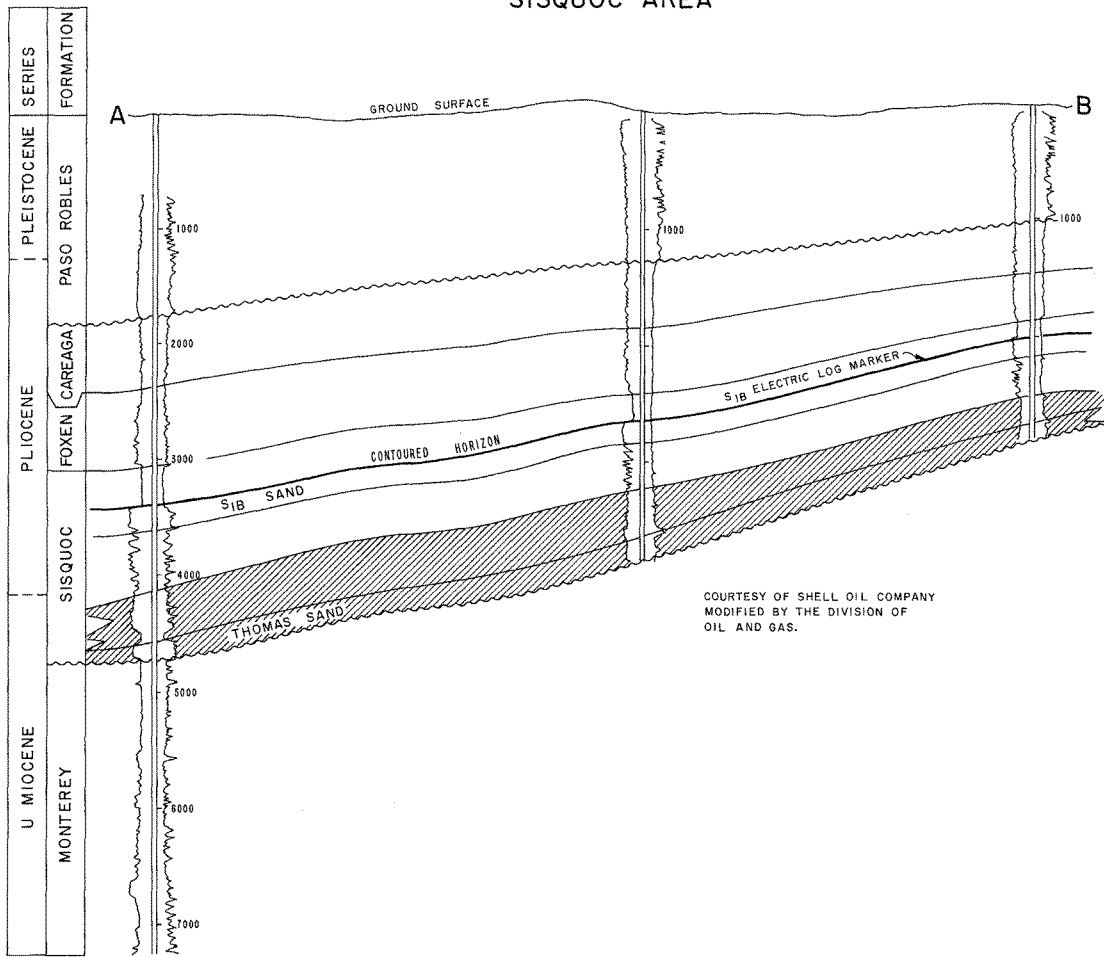
CENTRAL AREA



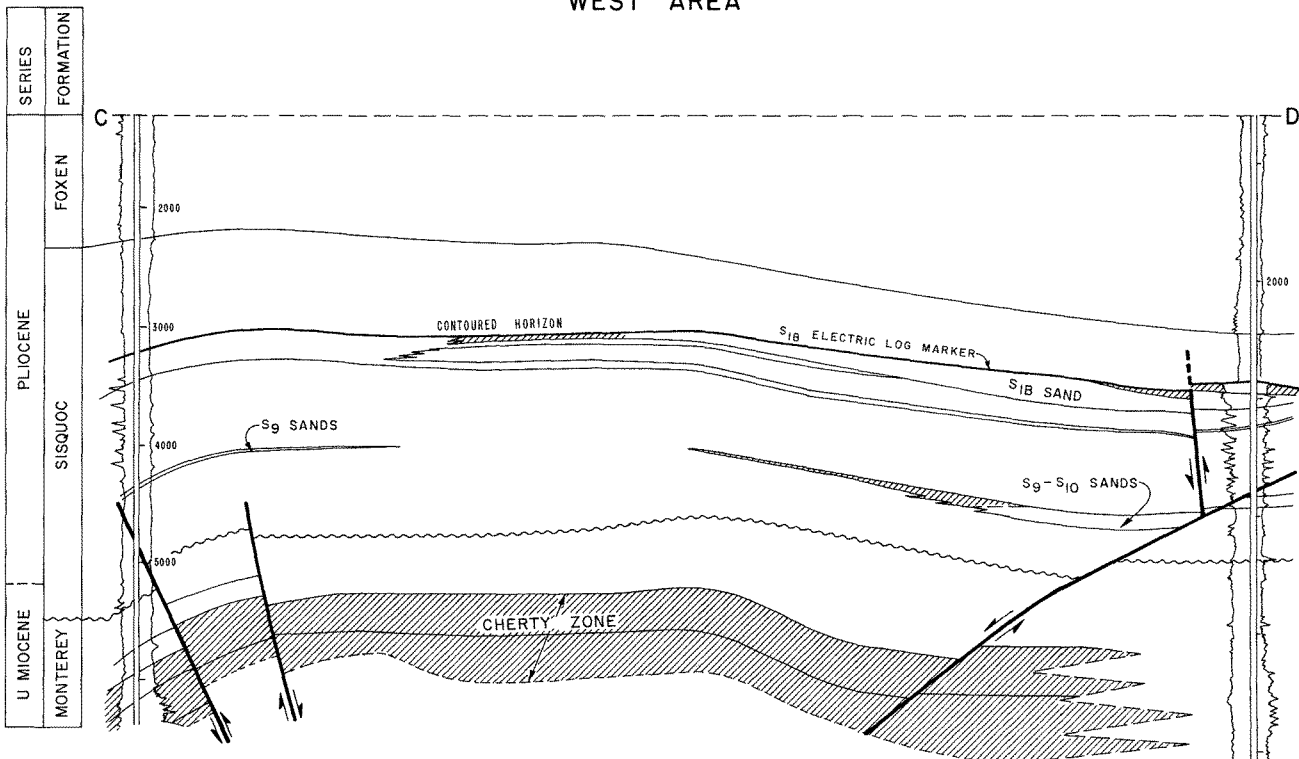
CAT CANYON OIL FIELD

Sisquoc Area and West Area

SISQUOC AREA

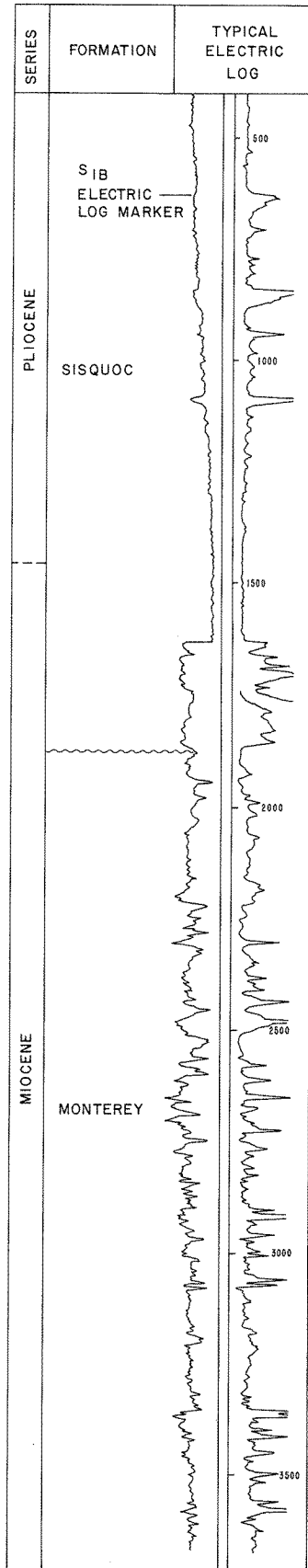


WEST AREA

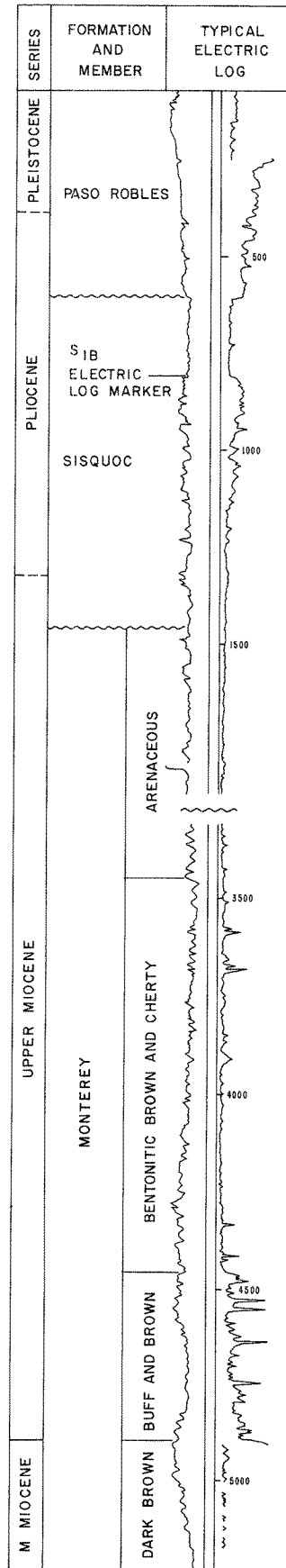


CAT CANYON OIL FIELD

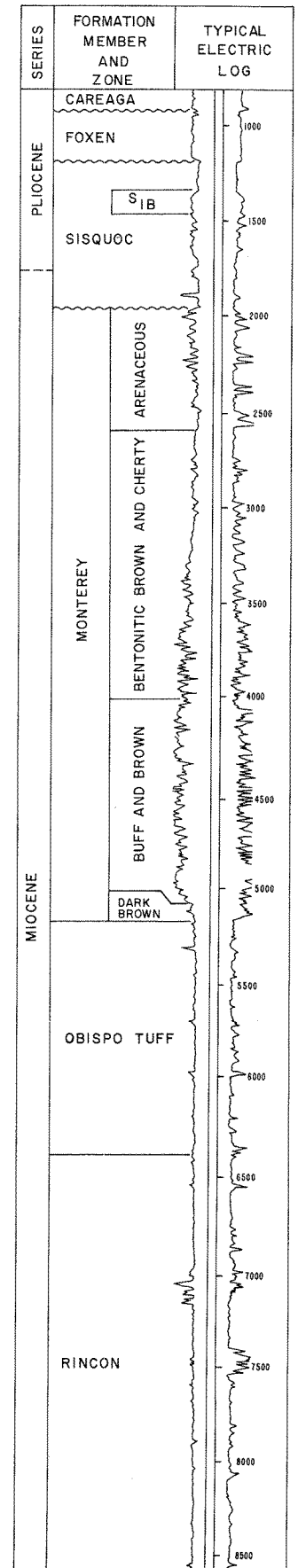
GATO RIDGE AREA



TINAQUAIC AREA



OLIVERA CANYON AREA



COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD

(SEE AREAS FOR ADDITIONAL INFORMATION)

DISCOVERY WELL AND DEEPEST WELL

| | Present operator and well designation | Original operator and well designation | Sec. T. & R. | B.&M. | Total depth (feet) | Pool (zone) | Strata & age at total depth |
|----------------|--|--|--------------|-------|--------------------|-------------|-----------------------------|
| Discovery well | Union Oil Co. of Calif. "Palmer Stendel" (Old) 1 | Palmer Union Oil Co. Well No. 1 | 26 9N 33W | SB | 3,200 | Sisquoc | |
| Deepest well | Shell Western Expl. & Prod. Inc. "Studer" 45-17 | Marathon Oil Co. "Studer" 45-17 | 17 9N 33W | SB | 9,887 a/ | | Monterey Miocene |

POOL DATA

| ITEM | SISQUOC | | | | | FIELD OR AREA DATA |
|--|---------------|--|--|--|--|-----------------------|
| Discovery date | 1908 | | | | | |
| Initial production rates | | | | | | |
| Oil (bbl/day) | 150 | | | | | |
| Gas (Mcf/day) | - | | | | | |
| Flow pressure (psi) | | | | | | |
| Bean size (in.) | | | | | | |
| Initial reservoir pressure (psi) | 1,000 | | | | | |
| Reservoir temperature (°F) | 105 | | | | | |
| Initial oil content (STB/ac.-ft.) | 1,700 | | | | | |
| Initial gas content (MSCF/ac.-ft.) | 0 | | | | | |
| Formation | Sisquoc | | | | | |
| Geologic age | Pliocene | | | | | |
| Average depth (ft.) | 2,800 | | | | | |
| Average net thickness (ft.) | 600 | | | | | |
| Maximum productive area (acres) | | | | | | 8,970 |
| RESERVOIR ROCK PROPERTIES | | | | | | |
| Porosity (%) | 27-31 | | | | | |
| So _i (%) | 68-70 | | | | | |
| Sw _i (%) | 30-32 | | | | | |
| Sg _i (%) | | | | | | |
| Permeability to air (md) | 150-500 | | | | | |
| RESERVOIR FLUID PROPERTIES | | | | | | |
| Oil: | | | | | | |
| Oil gravity (°API) | 13-15 | | | | | |
| Sulfur content (% by wt.) | 3.83 | | | | | |
| Initial solution GOR (SCF/STB) | | | | | | |
| Initial oil FVF (RB/STB) | | | | | | |
| Bubble point press. (psia) | | | | | | |
| Viscosity (cp) @ °F | 90-110 @ 105 | | | | | |
| Gas: | | | | | | |
| Specific gravity (air = 1.0) | | | | | | |
| Heating value (Btu/cu. ft.) | | | | | | |
| Water: | | | | | | |
| Salinity, NaCl (ppm) | 18,000-25,000 | | | | | |
| T.D.S. (ppm) | 20,000-26,000 | | | | | |
| R _w (ohm/m) (77°F) | 0.40-0.58 | | | | | |
| ENHANCED RECOVERY PROJECTS | | | | | | |
| Enhanced recovery projects | | | | | | |
| Date started | | | | | | |
| Date discontinued | | | | | | |
| Peak oil production (bbl) | | | | | | 8,373,328 |
| Year | | | | | | 1953 |
| Peak gas production, net (Mcf) | | | | | | 6,597,998 |
| Year | | | | | | 1967 |

Base of fresh water (ft.): See areas

Remarks: Four Deer Oil Field was originally classified as an area of Cat Canyon Oil Field.
a/ Directional well; true vertical depth is 9,810 feet.

Selected References: Prutzman, P.W., 1912, Petroleum in Southern California: Calif. State Mining Bureau Bull. 63.
Woodring, W.P., and M.N. Bramlette, 1950, Geology and Paleontology of the Santa Maria District, California: U.S. Geol. Survey Prof. Paper 222, p. 120.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

ED_001000_00020760-00005

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
EAST AREA

DISCOVERY WELL AND DEEPEST WELL

| | Present operator and well designation | Original operator and well designation | Sec. T. & R. | B.&M. | Total depth (feet) | Pool (zone) | Strata & age at total depth |
|----------------|---|--|--------------|-------|--------------------|-------------|-----------------------------|
| Discovery well | Shell Western Expl. & Prod. Inc. "Field Fee" 1 | Brooks Oil Co. Well No. 1 | 31 9N 32W | SB | 3,098 | Brooks | |
| Deepest well | Shell Western Expl. & Prod. Inc. "Victory" 20 | Palmer Union Oil Co. "Stendel" 20 | 30 9N 32W | SB | 7,200 | | Knoxville Cretaceous |

POOL DATA

| ITEM | SISQUOC | BROOKS | MONTEREY | | | FIELD OR AREA DATA |
|---|-----------|----------|--------------|--|--|--------------------|
| Discovery date | June 1953 | 1909 | October 1953 | | | |
| Initial production rates | | | | | | |
| Oil (bbl/day) | 25 | 150 | 7a/ | | | |
| Gas (Mcf/day) | - | - | - | | | |
| Flow pressure (psi) | | | | | | |
| Bean size (in.) | | | | | | |
| Initial reservoir pressure (psi) | 1,100 | 1,150 | - | | | |
| Reservoir temperature (°F) | 100-150 | 135 | - | | | |
| Initial oil content (STB/ac-ft.) | 1,600 | 2,000 | - | | | |
| Initial gas content (MSCF/ac-ft.) | 231 | - | - | | | |
| Formation | Sisquoc | Sisquoc | Monterey | | | |
| Geologic age | Pliocene | Pliocene | Miocene | | | |
| Average depth (ft.) | 3,000 | 3,500 | - | | | |
| Average net thickness (ft.) | 250 | 150 | - | | | |
| Maximum productive area (acres) | | | | | | 1,970 |

RESERVOIR ROCK PROPERTIES

| | | | | | | |
|--------------------------------|----------|-------|-----------------|--|--|--|
| Porosity (%) | 30-35*** | 35 | fractured shale | | | |
| Soi (%) | 60-70*** | 85 | - | | | |
| Swi (%) | 30-40*** | 15 | - | | | |
| Sgi (%) | | | - | | | |
| Permeability to air (md) | 1,480 | 3,350 | - | | | |

RESERVOIR FLUID PROPERTIES

| | | | | | | |
|-------------------------------------|-------|--------------|-------|--|--|--|
| Oil: | | | | | | |
| Oil gravity (°API) | 9-18 | 6-11 | 6 | | | |
| Sulfur content (% by wt.) | 4.1 | 6.0 | - | | | |
| Initial solution | | | | | | |
| GOR (SCF/STB) | 700 | 300 | - | | | |
| Initial oil FVF (RB/STB) | 1.06 | - | - | | | |
| Bubble point press. (psia) | | | - | | | |
| Viscosity (cp) @ °F | - | 15,000 @ 135 | - | | | |
| Gas: | | | | | | |
| Specific gravity (air = 1.0) | | | | | | |
| Heating value (Btu/cu. ft.) | | | | | | |
| Water: | | | | | | |
| Salinity, NaCl (ppm) | 5,485 | 7,242 | 5,660 | | | |
| T.D.S. (ppm) | 5,956 | 8,323 | 6,631 | | | |
| R _w (ohm/m) (77°F) | - | 0.12 | 0.13 | | | |

ENHANCED RECOVERY PROJECTS

| | | | | | | |
|----------------------------------|--------------|--------------|--|--|--|----|
| Enhanced recovery projects | steamflood | steamflood | | | | |
| Date started | 1979 | 1967 | | | | |
| Date discontinued | 1990 | 1990 | | | | |
| | cyclic steam | cyclic steam | | | | |
| | 1964 | 1964 | | | | |
| | active | active | | | | |
| Peak oil production (bbl) | | | | | | b/ |
| Year | | | | | | |
| Peak gas production, net (Mcf) | | | | | | b/ |
| Year | | | | | | |

Base of fresh water (ft.): 1,000

Remarks: A portion of this area was formerly known as the Slick-Moorman area.
a/ Commingled with production from the Brooks Sand.
b/ Early production not broken down by area.

Selected References: Bailey, Wm. C., 1953, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 39, No. 2.
Cross, R.K., 1940, East Cat Canyon Area of the Cat Canyon Oil Field: Calif. State Div. of Mines Bull. 118, p. 435.
Prutzman, P.W., 1912, Petroleum in Southern California: Calif. State Mining Bureau Bull. 63 p. 379.
Vonde, T.R., 1982, Specialized Pumping Techniques Applied to a Very Low Gravity Sand-Laden Crude, Cat Canyon Field, California: SPE Journal of Petroleum Technology, Vol. 34, No. 9, p. 1951.
Woodring, W.P. and M.N. Bramlette, 1950, Geology and Paleontology of the Santa Maria District, Calif.: U.S. Geol. Survey Prof. Paper 222, p. 121.

DATE: January 1991 ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
CENTRAL AREA

DISCOVERY WELL AND DEEPEST WELL

| | Present operator and well designation | Original operator and well designation | Sec. T. & R. | B. & M. | Total depth (feet) | Pool (zone) | Strata & age at total depth |
|----------------|---------------------------------------|---|--------------|---------|--------------------|-------------|-----------------------------|
| Discovery well | Texaco Producing Inc. "Los Alamos" 32 | Pacific Western Oil Corp. "Los Alamos" 32 | 6 8N 32W | SB | 5,210 | Sisquoc | Monterey Miocene |
| Deepest well | Same as above | " | " | " | " | " | " |

POOL DATA

| ITEM | SISQUOC a/ | | | | | FIELD OR AREA DATA |
|--|--------------|--|--|--|--|--------------------|
| Discovery date | May 1956 | | | | | |
| Initial production rates | | | | | | |
| Oil (bbl/day) | 184 | | | | | |
| Gas (Mcf/day) | - | | | | | |
| Flow pressure (psi) | | | | | | |
| Bean size (in.) | | | | | | |
| Initial reservoir pressure (psi) | 1,100 | | | | | |
| Reservoir temperature (°F) | 103 | | | | | |
| Initial oil content (STB/ac.-ft.) | 1,600 | | | | | |
| Initial gas content (MSCF/ac.-ft.) | | | | | | |
| Formation | Sisquoc | | | | | |
| Geologic age | Pliocene | | | | | |
| Average depth (ft.) | 2,800 | | | | | |
| Average net thickness (ft.) | 45 | | | | | |
| Maximum productive area (acres) | 620 | | | | | |
| RESERVOIR ROCK PROPERTIES | | | | | | |
| Porosity (%) | 32-37*** | | | | | |
| So _i (%) | 60-70*** | | | | | |
| Sw _i (%) | 30-40*** | | | | | |
| Sg _i (%) | | | | | | |
| Permeability to air (md) | 400-2,000*** | | | | | |
| RESERVOIR FLUID PROPERTIES | | | | | | |
| Oil: | | | | | | |
| Oil gravity (°API) | 7-15 | | | | | |
| Sulfur content (% by wt.) | | | | | | |
| Initial solution GOR (SCF/STB) | | | | | | |
| Initial oil FVF (RB/STB) | | | | | | |
| Bubble point press. (psia) | | | | | | |
| Viscosity (cp) @ °F | | | | | | |
| Gas: | | | | | | |
| Specific gravity (air = 1.0) | | | | | | |
| Heating value (Btu/cu. ft.) | | | | | | |
| Water: | | | | | | |
| Salinity, NaCl (ppm) | | | | | | |
| T.D.S. (ppm) | | | | | | |
| R _w (ohm/m) (77°F) | | | | | | |
| ENHANCED RECOVERY PROJECTS | | | | | | |
| Enhanced recovery projects | waterflood | | | | | |
| Date started | 1965 | | | | | |
| Date discontinued | 1986 | | | | | |
| | fireflood | | | | | |
| | 1963 | | | | | |
| | 1965 | | | | | |
| | cyclic steam | | | | | |
| | 1963 | | | | | |
| | active | | | | | |
| Peak oil production (bbl) | b/ | | | | | |
| Year | | | | | | |
| Peak gas production, net (Mcf) | b/ | | | | | |
| Year | | | | | | |

Base of fresh water (ft.): 800 - 1,300

Remarks: a/ Includes the S1b thru S9 sands.
b/ Early production not broken down by areas.

Selected References: Bailey, Wm. C., 1956, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 42, No. 2, p. 93.

DATE: January 1989 ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
SISQUOC AREA

DISCOVERY WELL AND DEEPEST WELL

| | Present operator and well designation | Original operator and well designation | Sec. T. & R. | B.&M. | Total depth (feet) | Pool (zone) | Strata & age at total depth |
|----------------|---------------------------------------|--|--------------|-------|--------------------|------------------|-----------------------------|
| Discovery well | B.E. Conway "Goodwin" 1 | Union Oil Co. of Calif. "Santa Maria Realty" 1 | 10 9N 33W | SB | 5,415 a/ | Sisquoc-Monterey | |
| Deepest well | Chevron U.S.A. Inc. "Fugler" 4-10 | Standard Oil Co. of Calif. "Fugler" 4-10 | 10 9N 33W | SB | 7,934 | | Point Sal Miocene |

POOL DATA

| ITEM | FOXEN | SISQUOC ^{b/} | THOMAS | MONTEREY | FIELD OR AREA DATA |
|--|--------------------|-----------------------|---------------|-----------------|--------------------|
| Discovery date | May 1980 | December 1944 | November 1954 | December 1944 | |
| Initial production rates | | | | | |
| Oil (bbl/day) | 4 ^{c/} | 69 ^{d/} | 89 | 69 | |
| Gas (Mcf/day) | | | | | |
| Flow pressure (psi) | | | | | |
| Bean size (in.) | | | | | |
| Initial reservoir pressure (psi) | 350 | 820-1,300 | 1,700-1,900 | 2,000 | |
| Reservoir temperature (°F) | 79 | 105-120 | 130-120 | 180 | |
| Initial oil content (STB/ac.-ft.) | 1,580 | 1,780 | - | 325 | |
| Initial gas content (MSCF/ac.-ft.) | | | | | |
| Formation | Foxen | Sisquoc | Sisquoc | Monterey | |
| Geologic age | Pliocene | Pliocene | Pliocene | Miocene | |
| Average depth (ft.) | 1,750 | 2,750 | 4,900 | 4,000 | |
| Average net thickness (ft.) | 50 | 500 | 70 | 500 | |
| Maximum productive area (acres) | | | | | 2,420 |
| RESERVOIR ROCK PROPERTIES | | | | | |
| Porosity (%) | 30-35 | 25-33 | 20-33 | fractured shale | |
| So ₁ (%) | 68-73 [†] | 50-70 | 30-50 | - | |
| Sw _i (%) | 27-32 [†] | 20-50 | 33-60 | - | |
| Sg _i (%) | - | 0-10 | 10-17 | - | |
| Permeability to air (md) | 358-1,280 | 750-2,000 | 300-500 | - | |
| RESERVOIR FLUID PROPERTIES | | | | | |
| Oil: | | | | | |
| Oil gravity (°API) | 9.4 | 6.0-8.0 | 8.0-16.0 | 6.4-11.0 | |
| Sulfur content (% by wt.) | - | 4.5 | - | - | |
| Initial solution GOR (SCF/STB) | - | 0-100 | - | - | |
| Initial oil FVF (RB/STB) | - | 1.072 | - | - | |
| Bubble point press. (psia) | - | | | | |
| Viscosity (cp) @ °F | - | 325 @ 130 | 35-40 @ 72 | 500 @ 180 | |
| Gas: | | | | | |
| Specific gravity (air = 1.0) | - | 0.66 | 0.80 | - | |
| Heating value (Btu/cu. ft.) | - | | | | |
| Water: | | | | | |
| Salinity, NaCl (ppm) | 9,200+ | 588-13,332 | 18,700 | 10,550-17,300 | |
| T.D.S. (ppm) | - | 2,870-14,287 | 20,604 | 12,547-20,722 | |
| R _w (ohm/m) (77°F) | 0.60+ | 0.43-3.13 | 0.30 | 0.32-0.51 | |
| ENHANCED RECOVERY PROJECTS | | | | | |
| Enhanced recovery projects | cyclic steam | cyclic steam | | | |
| Date started | 1980 | 1963 | | | |
| Date discontinued | active | active | | | |
| | | steamflood | | | |
| | | 1968 | | | |
| | | 1986 | | | |
| | | waterflood | | | |
| | | 1970 | | | |
| | | 1971 | | | |
| | | fireflood | | | |
| | | 1973 | | | |
| | | 1978 | | | |
| Peak oil production (bbl) | | | | | e/ |
| Year | | | | | e/ |
| Peak gas production, net (Mcf) | | | | | e/ |
| Year | | | | | e/ |

Base of fresh water (ft.): 1,000 - 1,400

Remarks: A portion of this area was formerly known as the Bradley Canyon area.
a/ Original total depth. The well was subsequently redrilled to a total depth of 5,550 feet; true vertical depth is 5,534 feet.
b/ Includes the S₁ thru S₈ sands.
c/ Commingled with production from the Sisquoc.
d/ Commingled with production from the Monterey.
e/ Early production not broken down by area.

Selected References: Angrove T.J., 1970, Optimizing High Temperature Steam Stimulation Operations, SPE Paper 3178, presented at the California Regional Meeting of the Society of Petroleum Engineers of AIME, Santa Barbara, Calif., Oct. 28-30.
Bailey, Wm. C., 1954, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 40, No. 2.

DATE: January 1989 †Log derived value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
WEST AREA

DISCOVERY WELL AND DEEPEST WELL

| | Present operator and well designation | Original operator and well designation | Sec. T. & R. | B. & M. | Total depth (feet) | Pool (zone) | Strata & age at total depth |
|----------------|--|--|--------------|---------|--------------------|-------------|-----------------------------|
| Discovery well | Union Oil Co. of Calif. "Palmer Stender" (Old) 1 | Palmer Union Oil Co. Well No. 1 | 26 9N 33W | SB | 3,200 | Sisquoc | |
| Deepest well | Shell Western Expl. & Prod. Inc. "Studer" 45-17 | Marathon Oil Co. "Studer" 45-17 | 17 9N 33W | SB | 9,887 a/ | | Monterey Miocene |

POOL DATA

| ITEM | SISQUOC ^{b/} | S ₆ -S _{6A} GAS _C ^{d/} | ALEXANDER ^{d/} | LOS FLORES | FIELD OR AREA DATA |
|--|-----------------------|---|-------------------------|-------------|-----------------------|
| Discovery date | 1908 | September 1960 | March 1953 | August 1938 | |
| Initial production rates | | | | | |
| Oil (bbl/day) | 150 | - | 200 | 716 | |
| Gas (Mcf/day) | - | 500 | - | - | |
| Flow pressure (psi) | - | 1,000-1,025 | - | - | |
| Bean size (in.) | - | 6/64 | - | - | |
| Initial reservoir pressure (psi) | 1,000 | - | - | 1,600-1,900 | |
| Reservoir temperature (°F) | 105 | - | - | 175-200 | |
| Initial oil content (STB/ac.-ft.) | 1,700 | - | - | - | |
| Initial gas content (MSCF/ac.-ft.) | 0 | - | - | - | |
| Formation | Sisquoc | Sisquoc | Sisquoc | Monterey | |
| Geologic age | Pliocene | Pliocene | Pliocene | Miocene | |
| Average depth (ft.) | 2,800 | 3,405 | 3,750 | 6,000 | |
| Average net thickness (ft.) | 600 | 45 | 200 | 1,500 | |
| Maximum productive area (acres) | - | 40 | - | - | 2,880 |

RESERVOIR ROCK PROPERTIES

| | | | | | |
|--------------------------------|---------|--------------------|-----------------|-----------------|--|
| Porosity (%) | 27-31 | 27-31 | 23-30 | fractured shale | |
| So _g (%) | 68-70 | - | 79 ¹ | - | |
| Sw _i (%) | 30-32 | 11-13 ¹ | 21 ¹ | - | |
| Sg _i (%) | - | 87-89 ¹ | - | - | |
| Permeability to air (md) | 150-500 | 150-500 | 150-400 | - | |

RESERVOIR FLUID PROPERTIES

| | | | | | |
|--------------------------------------|---------------|---|--------|---------------|--|
| Oil: | | | | | |
| Oil gravity (°API) | 13.0-16.5 | - | 23.0 | 11.0-22.0 | |
| Sulfur content (% by wt.) | 3.03 | - | 3.13 | 5.07 | |
| Initial solution GOR (SCF/STB) | 800 | - | 766 | 1,000-6,300 | |
| Initial oil FVF (RB/STB) | | | | | |
| Bubble point press. (psia) | 3,100 @ 100 | - | - | 1,200 @ 100 | |
| Viscosity (cp) @ °F | | | | | |
| Gas: | | | | | |
| Specific gravity (air = 1.0) | | | | | |
| Heating value (Btu/cu. ft.) | | | | | |
| Water: | | | | | |
| Salinity, NaCl (ppm) | 18,000-25,000 | - | 20,544 | 9,700-13,000 | |
| T.D.S. (ppm) | 20,000-26,000 | - | - | 15,500-18,000 | |
| R _w (ohm/m) (77°F) | 0.25-0.33 | - | - | 0.39-0.56 | |

ENHANCED RECOVERY PROJECTS

| | | | | | |
|----------------------------------|--------------|---------|--|---------------|----|
| Enhanced recovery projects | waterflood | | | gas injection | |
| Date started | 1954 | | | 1947 | |
| Date discontinued | active | | | 1955 | |
| | cyclic steam | | | waterflood | |
| | 1964 | | | 1972 | |
| | active | | | 1974 | |
| Peak oil production (bbl) | | | | | e/ |
| Year | | | | | e/ |
| Peak gas production, net (Mcf) | | 143,086 | | | e/ |
| Year | | 1961 | | | |

Base of fresh water (ft.): 1,000

Remarks: a/ Directional well; true vertical depth is 9,810 feet. b/ Includes the S₁ through S₆ sands; formerly called the Pliocene pool.
c/ The zone was abandoned in 1978. Cumulative production is 310,000 Mcf of gas. Only one well, Mobil Oil Corp. "Los Flores" 109-21, produced from this zone. d/ Includes the S₉ thru S₁₀ sands. e/ Early production not broken down by area.

Selected References: Huey, W.F., 1954, West Cat Canyon Area of Cat Canyon Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 40, No. 1.
Manlove, C., 1938, West Cat Canyon Oil Field: Calif. State Div. of Mines Bull. 118, p. 432.
Prutzman, P.W., 1912, Petroleum in Southern California: Calif. State Mining Bureau Bull. 63, p. 382.
Regan, L.J. Jr., and A.W. Hughes, 1949, Fractured Reservoirs of Santa Maria District, California: Am. Assoc. Petroleum Geologists Bull., Vol. 33, No. 1, p. 32.
Woodring, W.P., and M.N. Bramlette, 1950, Geology and Paleontology of the Santa Maria District, California: U.S. Geol. Survey Prof. Paper 222, p. 120.

DATE: January 1989 iLog derived value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
GATO RIDGE AREA

DISCOVERY WELL AND DEEPEST WELL

| | Present operator and well designation | Original operator and well designation | Sec. T. & R. | B. & M. | Total depth (feet) | Pool (zone) | Strata & age at total depth |
|----------------|---------------------------------------|--|--------------|---------|--------------------|-------------|-----------------------------|
| Discovery well | Pinal Dome Corp. Well No. T-2 | Pinal Dome Oil Co. Well No. T-2 | 15 8N 32W | SB | 3,400 | Monterey | |
| Deepest well | Gato Corp. "Tognazzini" 1 | Barnsdall Oil Co. of Calif. "Tognazzini" 1 | 9 8N 32W | SB | 6,510 | | Monterey Miocene |

POOL DATA

| ITEM | SISQUOC | MONTEREY | | | | FIELD OR AREA DATA |
|--|------------|--------------|--|--|--|--------------------|
| Discovery date | March 1937 | January 1915 | | | | |
| Initial production rates | | | | | | |
| Oil (bbl/day) | 580a/ | 50 | | | | |
| Gas (Mcf/day) | - | 0 | | | | |
| Flow pressure (psi) | | | | | | |
| Bean size (in.) | | | | | | |
| Initial reservoir pressure (psi) | - | 500** | | | | |
| Reservoir temperature (°F) | 110 | 110-160** | | | | |
| Initial oil content (STB/ac.-ft.) | | | | | | |
| Initial gas content (MSCF/ac.-ft.) | | | | | | |
| Formation | Sisquoc | Monterey | | | | |
| Geologic age | Pliocene | Miocene | | | | |
| Average depth (ft.) | 2,210 | 3,800 | | | | |
| Average net thickness (ft.) | 200 | 300 | | | | |
| Maximum productive area (acres) | | | | | | 690 |

RESERVOIR ROCK PROPERTIES

| | | | | | | |
|--------------------------------|-------------|-----------------|--|--|--|--|
| Porosity (%) | 25-32*** | fractured shale | | | | |
| So _i (%) | 65*** | - | | | | |
| Sw _i (%) | 35*** | - | | | | |
| Sg _i (%) | | - | | | | |
| Permeability to air (md) | 1,000-4,000 | - | | | | |

RESERVOIR FLUID PROPERTIES

| | | | | | | |
|--------------------------------------|----|-------------|--|--|--|--|
| Oil: | | | | | | |
| Oil gravity (°API) | 13 | 9-14 | | | | |
| Sulfur content (% by wt.) | - | 5.87 | | | | |
| Initial solution GOR (SCF/STB) | | | | | | |
| Initial oil FVF (RB/STB) | | | | | | |
| Bubble point press. (psia) | | | | | | |
| Viscosity (cp) @ °F. | - | 1,000 @ 160 | | | | |
| Gas: | | | | | | |
| Specific gravity (air = 1.0) | | | | | | |
| Heating value (Btu/cu. ft.) | | | | | | |
| Water: | | | | | | |
| Salinity, NaCl (ppm) | - | 7,425 | | | | |
| T.D.S. (ppm) | - | 11,500 | | | | |
| R _w (ohm/m) (77°F) | | | | | | |

ENHANCED RECOVERY PROJECTS

| | | | | | | |
|----------------------------------|--|--|--|--|--|----|
| Enhanced recovery projects | | | | | | |
| Date started | | | | | | |
| Date discontinued | | | | | | |
| Peak oil production (bbl) | | | | | | b/ |
| Year | | | | | | |
| Peak gas production, net (Mcf) | | | | | | b/ |
| Year | | | | | | |

Base of fresh water (ft.): 0 - 400

Remarks: Pinal Dome Corp. well No. T-2 produced a total of 8,062 bbl of oil from March 1916 to June 1917. This production was not considered commercial at the time, and the well was abandoned in 1920.
a/ Commingled with production from the Monterey.
b/ Early production not broken down by area.

Selected References:

Cross, R.K., 1940, Gato Ridge Area of Cat Canyon Oil Field: State Div. of Mines, Bull. 118, p. 438.
Dolman, S.G., 1931, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 17, No. 3, p. 34.
Woodring, W.P., and M.N. Bramlette, 1950, Geology and Paleontology of the Santa Maria District, California: U.S. Geol. Survey Prof. Paper 222, p. 121.

DATE: January 1989 **Estimated value ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
TINAQUAIC AREA

DISCOVERY WELL AND DEEPEST WELL

| | Present operator and well designation | Original operator and well designation | Sec. T. & R. | B.&M. | Total depth (feet) | Pool (zone) | Strata & age at total depth |
|----------------|---------------------------------------|--|--------------|-------|--------------------|-------------|-----------------------------|
| Discovery well | Richards Oil Co. "Wickenden" 1 | Four-Five-Six Oil Co. "Wickenden" 1 | 33 9N 32W | SB | 4,606 | Monterey | |
| Deepest well | Richards Oil Co. "Wickenden" 5 | Continental Oil Co. "Wickenden" 5 | 33 9N 32W | SB | 5,250 | | Monterey Miocene |

POOL DATA

| ITEM | MONTEREY | | | | | FIELD OR AREA DATA |
|--|-----------------|--|--|--|--|--------------------|
| Discovery date | February 1945a/ | | | | | |
| Initial production rates | | | | | | |
| Oil (bbl/day) | 90 | | | | | |
| Gas (Mcf/day) | 0 | | | | | |
| Flow pressure (psi) | | | | | | |
| Bean size (in.) | | | | | | |
| Initial reservoir pressure (psi) | | | | | | |
| Reservoir temperature (°F) | 103 | | | | | |
| Initial oil content (STB/ac.-ft.) | | | | | | |
| Initial gas content (MSCF/ac.-ft.) | | | | | | |
| Formation | Monterey | | | | | |
| Geologic age | Miocene | | | | | |
| Average depth (ft.) | 2,020-3,180 | | | | | |
| Average net thickness (ft.) | 1,200-3,200 | | | | | |
| Maximum productive area (acres) | 70 | | | | | |
| RESERVOIR ROCK PROPERTIES | | | | | | |
| Porosity (%) | fractured shale | | | | | |
| So _i (%) | | | | | | |
| Sw _i (%) | | | | | | |
| Sg _i (%) | | | | | | |
| Permeability to air (md) | | | | | | |
| RESERVOIR FLUID PROPERTIES | | | | | | |
| Oil: | | | | | | |
| Oil gravity (°API) | 6-8 | | | | | |
| Sulfur content (% by wt.) | | | | | | |
| Initial solution GOR (SCF/STB) | | | | | | |
| Initial oil FVF (RB/STB) | | | | | | |
| Bubble point press. (psia) | | | | | | |
| Viscosity (cp) @ °F | | | | | | |
| Gas: | | | | | | |
| Specific gravity (air = 1.0) | | | | | | |
| Heating value (Btu/cu. ft.) | | | | | | |
| Water: | | | | | | |
| Salinity, NaCl (ppm) | | | | | | |
| T.D.S. (ppm) | | | | | | |
| R _w (ohm/m) (77°F) | | | | | | |
| ENHANCED RECOVERY PROJECTS | | | | | | |
| Enhanced recovery projects | | | | | | |
| Date started | | | | | | |
| Date discontinued | | | | | | |
| Peak oil production (bbl) | | | | | | |
| Year | 7,342 | | | | | |
| Peak gas production, net (Mcf) | 1948 | | | | | |
| Year | | | | | | |

Base of fresh water (ft.): 300 - 600

Remarks: a/ The heavy oil could not be produced efficiently using the techniques available at the time, and the well was abandoned in December 1945. The well was reentered, deepened to 4,972 feet, and completed by Foxen Ridge Oil Company in June-July 1948.

Selected References: Dolman, S.G., 1945, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 31, No. 2.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
OLIVERA CANYON AREA

DISCOVERY WELL AND DEEPEST WELL

| | Present operator and well designation | Original operator and well designation | Sec. T. & R. | B. & M. | Total depth (feet) | Pool (zone) | Strata & age at total depth |
|----------------|---|--|--------------|---------|--------------------|-------------|-----------------------------|
| Discovery well | Shell Western Expl. & Prod. Inc. "McNee" 2 | Union Oil Co. of Calif. "McNee" 2 | 20 9N 32W | SB | 4,034 | Monterey | |
| Deepest well | Shell Western Expl. & Prod. Inc. "McNee" 4 | Union Oil Co. of Calif. "McNee" 4 | 20 9N 32W | SB | 9,001 | | Rincon(?) Miocene |

POOL DATA

| ITEM | SISQUOC | MONTEREY@/ | | | | FIELD OR AREA DATA |
|--|----------------|-----------------|--|--|--|--------------------|
| Discovery date | October 1979 | June 1944 | | | | |
| Initial production rates | | | | | | |
| Oil (bbl/day) | 34 | 37 | | | | |
| Gas (Mcf/day) | | | | | | |
| Flow pressure (psi) | | | | | | |
| Bean size (in.) | | | | | | |
| Initial reservoir pressure (psi) | 1,350*** | 1,400** | | | | |
| Reservoir temperature (°F) | - | 135** | | | | |
| Initial oil content (STB/ac.-ft.) | | | | | | |
| Initial gas content (MSCF/ac.-ft.) | | | | | | |
| Formation | Sisquoc | Monterey | | | | |
| Geologic age | Pliocene | Miocene | | | | |
| Average depth (ft.) | 2,550 | 3,000 | | | | |
| Average net thickness (ft.) | 20 | 1,500 | | | | |
| Maximum productive area (acres) | | | | | | 240 |
| RESERVOIR ROCK PROPERTIES | | | | | | |
| Porosity (%) | 25-32*** | fractured shale | | | | |
| So _g (%) | 65*** | - | | | | |
| Sw _i (%) | 35*** | - | | | | |
| Sg _g (%) | | - | | | | |
| Permeability to air (md) | 1,000-4,000*** | - | | | | |
| RESERVOIR FLUID PROPERTIES | | | | | | |
| Oil: | | | | | | |
| Oil gravity (°API) | 8.4 | 6.0-8.0 | | | | |
| Sulfur content (% by wt.) | | | | | | |
| Initial solution GOR (SCF/STB) | | | | | | |
| Initial oil FVF (RB/STB) | | | | | | |
| Bubble point press. (psia) | | 750 @ 135** | | | | |
| Viscosity (cp) @ °F | | | | | | |
| Gas: | | | | | | |
| Specific gravity (air = 1.0) | | | | | | |
| Heating value (Btu/cu. ft.) | | | | | | |
| Water: | | | | | | |
| Salinity, NaCl (ppm) | 2,605 | 11,984-24,800 | | | | |
| T.D.S. (ppm) | 3,765 | 17,660-30,002 | | | | |
| R _w (ohm/m) (77°F) | 1.80 | 0.23-0.34 | | | | |
| ENHANCED RECOVERY PROJECTS | | | | | | |
| Enhanced recovery projects | | | | | | |
| Date started | | | | | | |
| Date discontinued | | | | | | |
| Peak oil production (bbl) | 15,911 | 369,422 | | | | |
| Year | 1981 | 1953 | | | | |
| Peak gas production, net (Mcf) | | | | | | |
| Year | | | | | | |

Base of fresh water (ft.): 600

Remarks: a/ Includes Cherty, Bentonitic Brown, and Buff & Brown zones.

Selected References: Dolman, S.G., 1944, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 30, No. 2, p. 43.

DATE: January 1989 **Estimated value ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS